

IN THE CLAIMS:

The text of all pending claims (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1-3, 8, 9, and 11-14 in accordance with the following:

1. (CURRENTLY AMENDED) A converting apparatus, comprising:

a document inputting device inputting information of a structured document that is written with a set of hierarchical elements, and composed of a plurality of records each including one text element or more;

a joining device calculating a tree structure of a document object model of the structured document, obtaining a list of text elements linked to a text element from the tree structure, obtaining text elements having a same element name successively appear in the list as text elements relatively with a same path from a root among two records or more of the structured document, calculating a hash value for element names of text elements on a route from a root of a subtree to each of the text elements relatively with the same path, and generating a new text element by combining contents of the text elements relatively with the same path to preserve a text relationship between the contents if the text elements relatively with the same path have a same hash value;

a generating device generating a new record that includes the new text element and inherits a relative position relationship of text elements in the two records or more;

a converting device converting the structured document by replacing the two records or more with the new record, thereby decreasing the number of hierarchical elements of the structured document and preserving text element information of the records; and

a document outputting device outputting the structured document after being converted.

2. (CURRENTLY AMENDED) The converting apparatus according to claim 1, further comprising:

a key inputting device inputting a search key; and

a searching device searching the structured document after being converted, extracting a character string corresponding to a position of a detected character string from contents of an

element in a certain record when a character string corresponding to the search key is detected from contents of another element in the certain record, deleting character strings at other positions in the contents of the elements in the certain record, restoring a record before being converted, which includes the search key, from the detected character string and the extracted character string, and outputting the restored record as a search result.

3. (CURRENTLY AMENDED) A converting apparatus, comprising:

a document inputting device inputting information of a structured document written with a set of hierarchical elements;

a storing device storing the information of the structured document;

a joining device calculating a tree structure of a document object model of the structured document, obtaining a first list of text elements linked to a certain text element from the tree structure, obtaining text elements having a same element name successively appear in the first list as a first combination of elements that successively exist side by side in a level immediately below the certain text element in the structured document, obtaining a second list of text elements linked to a text element lower than the certain text element from the tree structure, obtaining text elements having a same element name successively appear in the second list as a second combination of elements which are in a certain level lower than the elements of the first combination, calculating a hash value for element names of text elements on a route from a root of a subtree to each element included in the first and second combination, and generating a plurality of new text elements by combining, as synthesis targets, content of each element included in the first combination and content of each element included in the second combination the combined elements have a same hash value, wherein elements in each level on a route from the elements of the first combination to the certain level have a same element name to each other, so that a text relationship between the combined contents can be preserved;

a generating device generating a synthesized substructure that includes the plurality of new text elements, and inherits a relative position relationship of original elements among the plurality of new text elements;

a duplicating device generating a duplication of an unjoined element below a new element included in a synthesized substructure generated from an element higher than the unjoined element;

a deleting device deleting an unnecessary original element;

a converting device converting the structured document into a structured document of a synthetic type configured by a synthesized substructure by using said joining device, said generating device, said duplicating device, and said deleting device, thereby decreasing the number of hierarchical elements of the structured document and preserving text element information of records; and

a document outputting device outputting the structured document of the synthetic type.

4. (ORIGINAL) The converting apparatus according to claim 3, wherein
said generating device generates the synthesized substructure if a combination of elements that successively exist side by side and have a same element name in two levels or more on the route to the certain level is not found.

5. (ORIGINAL) The converting apparatus according to claim 3, wherein
said joining device divides the second combination of the elements into a plurality of groups each composed of a predetermined number of elements, and specifies the synthesis targets based on the predetermined number of elements included in each of the groups.

6. (ORIGINAL) The converting apparatus according to claim 3, wherein
said joining device generates contents of the new elements by inserting a delimiter between two joined contents.

7. (PREVIOUSLY PRESENTED) The converting apparatus according to claim 6, wherein
said joining device consecutively inserts the delimiter in the contents of the new elements if content of an element which becomes the synthesis targets is lacking.

8. (CURRENTLY AMENDED) The converting apparatus according to claim 6, further comprising:

a key inputting device inputting a search key; and
a searching device comparing a character string between two delimiters, which is included in contents of elements within the structured document of the synthetic type, with a character string of the search key, obtaining an order of a delimiter preceding a character string corresponding to the search key when the character string corresponding to the search key is detected from contents of ~~elements~~an element within a certain synthesized substructure,

extracting a character string between a delimiter corresponding to the order and a next delimiter in contents of another element in the certain synthesized substructure, deleting character strings between other two delimiters in the contents of the elements in the certain synthesized substructure, restoring a corresponding portion of the structured document before being converted from the detected character string and the extracted character string, and outputting the restored portion as a search result.

9. (CURRENTLY AMENDED) A computer-readable storage medium on which is recorded a program for causing a computer to execute a process, said process comprising:

- calculating a tree structure of a document object model of a structured document that is written with a set of hierarchical elements and composed of a plurality of records each including one text element or more;

- obtaining a list of text elements linked to a text element from the tree structure;

- obtaining text elements having a same element name successively appear in the list as text elements relatively with a same path from a root among two records or more of the structured document;

- calculating a hash value for element names of text elements on a route from a root of a subtree to each of the text elements relatively with the same path;

- generating a new text element by combining contents of the text elements relatively with the same path to preserve a text relationship between the contents if the text elements relatively with the same path have a same hash value;

- generating a new record that includes the new text element and inherits a relative position relationship of text elements in the two records or more, thereby decreasing the number of hierarchical elements of the structured document and preserving text element information of the records; and

- converting the structured document by replacing the two records or more with the new record.

10. (CANCELLED)

11. (CURRENTLY AMENDED) A converting apparatus, comprising:

- document inputting means for inputting information of a structured document that is written with a set of hierarchical elements, and composed of a plurality of records each including

one text element or more;

joining means for calculating a tree structure of a document object model of the structured document, obtaining a list of text elements linked to a text element from the tree structure, obtaining text elements having a same element name successively appear in the list as text elements relatively with a same path from a root among two records or more of the structured document, calculating a hash value for element names of text elements on a route from a root of a subtree to each of the text elements relatively with the same path, and generating a new text element by combining contents of the text elements relatively with the same path to preserve a text relationship between the contents if the text elements relatively with the same path have a same hash value;

generating means for generating a new record that includes the text new element and inherits a relative position relationship of text elements in the two records or more;

converting means for converting the structured document by replacing the two records or more with the new record, thereby decreasing the number of hierarchical elements of the structured document and preserving text element information of the records; and

document outputting means for outputting the structured document after being converted.

12. (CURRENTLY AMENDED) A method of compressing a hierarchically structured document, comprising:

analyzing a hierarchy of the hierarchically structured document; and

combining hierarchical text elements of the hierarchically structured document responsive to common element names for the hierarchical text elements and a common child element structure of the hierarchical text elements and preserving text element information of the text elements, and

wherein the combining calculates a tree structure of a document object model of the hierarchically structured document, obtains a list of hierarchical text elements linked to a hierarchical text element from the tree structure, obtains hierarchical text elements having a same element name successively appear in the list, calculating a hash value for element names of text elements on a route from a root of a subtree to each of the obtained hierarchical text elements, and combines the obtained hierarchical text elements if the obtained hierarchical text elements have a same hash value.

13. (CURRENTLY AMENDED) A method of compressing a hierarchically structured document, comprising:

- analyzing a hierarchy of the hierarchically structured document; and
- combining hierarchical text elements of the hierarchically structured document responsive to common features of parts of the hierarchy of the hierarchically structured document and preserving text element information of the text elements, and

wherein the combining calculates a tree structure of a document object model of the hierarchically structured document, obtains a list of hierarchical text elements linked to a hierarchical text element from the tree structure, obtains hierarchical text elements having a same element name successively appear in the list, calculating a hash value for element names of text elements on a route from a root of a subtree to each of the obtained hierarchical text elements, and combines the obtained hierarchical text elements if the obtained hierarchical text elements have a same hash value.

14. (CURRENTLY AMENDED) A method of compressing a hierarchically structured document, comprising:

- analyzing a hierarchy of the hierarchically structured document; and
- compressing the hierarchy of the structured document by combining text element content and preserving a hierarchically defined relationship and text element information of text elements, and

wherein the compressing calculates a tree structure of a document object model of the hierarchically structured document, obtains a list of hierarchical text elements linked to a hierarchical text element from the tree structure, obtains hierarchical text elements having a same element name successively appear in the list, calculating a hash value for element names of text elements on a route from a root of a subtree to each of the obtained hierarchical text elements, and combines the obtained hierarchical text elements if the obtained hierarchical text elements have a same hash value.